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EXAMINER
RICHER, AARON M

ART UNIT	PAPER NUMBER
2628	

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02/26/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>02 October 2007</u>.

2a) ☒ This action is **FINAL.** 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *13-20 and 34-49* is/are pending in the application.

    4a) Of the above claim(s) *34-49* is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *13-20* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)   4) ☐ Interview Summary (PTO-413)
                                           Paper No(s)/Mail Date. _____.
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)   5) ☐ Notice of Informal Patent Application
       Paper No(s)/Mail Date _____.   6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments filed October 2, 2007 have been fully considered but they are not persuasive.

2.   Applicant's arguments with respect to claim 13 and 15 have been considered but are moot in view of the new ground(s) of rejection.

3.   As to claim 20, applicant argues that the range bins in Fisher do not correspond to trapezoids, and therefore Fisher does not disclose a column of a texture mapped along a radial bounded by the top and bottom of the trapezoids. However, it is clear from fig. 4d and 4e that a trapezoid is shown, and it is clear from col. 2, line 62-col. 3, line 24 that a range bin set is the portion of the square range bin area belonging to each radial. Given that the texture is mapped into the range bin set (col. 5, lines 45-60) and that each radial has a column of texture (col. 6, lines 36-44), Fisher discloses a column mapped along a radial bounded by a range bin set, where each range bin set is bounded by the top and bottom of a trapezoid.

4.   As to claim 16, applicant argues that Mukoyama discloses polygons arranged around a central axis but not textures arranged symmetrically with respect to a midline of the polygons. Examiner notes, however, that p. 2, section 0019 of Mukoyama discloses texture data mapped "radially about a prescribed center axis". This statement makes it clear that it is the texture data that is mapped symmetrically, or radially, and it is not simply the polygons themselves that are symmetric.

5.   As to claim 17, applicant argues that Ikedo discloses interleaving techniques, and

not applying a reverse perspective view transformation to columns of texels. Examiner

notes that the previous Office Action's citation to Ikedo contained an incorrect patent

number. The Ikedo reference is actually U.S. Patent 5,900,881, not 5,900,861 as

indicated by the previous examiner. Examiner notes that both the reference name,

"Ikedo", and the citation on the PTO-892 form, mailed July 2, 2007 were correct. The

Ikedo reference is directed to bump mapping, which is a kind of texture mapping,

wherein reverse-projection transformation takes place (col. 5, lines 45-51).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 13, 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Fisher (U.S. Patent 6,621,451) in view of Michail (U.S. Publication 2004/0263516)

and further in view of Obata (U.S. Patent 5,335,319).

7.   As to claim 13, Fisher discloses a computer implemented method of representing

an arc (col. 6, lines 1-45; figs. 4d and 4e), the method comprising:

selecting multiple vertices of the arc (fig. 4d; col. 4, lines 24-40; col. 6, lines 34-

45);

obtaining trapezoids corresponding to the vertices (col. 2, line 65-col. 3, line 5; col. 5, lines 45-65; col. 6, lines 36-45; fig. 4e; radial divisions are shown intersecting range bins, forming range bin sets that are trapezoidal);

obtaining a texture having multiple columns of texels (col. 3, lines 25-35; col. 4, lines 1-6; regular textures are stored in rectangular format in texture memory; these textures are obtained by the processor as necessary as in col. 7, lines 15-20 and col. 8, lines 40-50).

Fisher does not explicitly disclose representing the trapezoids as triangles and mapping the texture to the triangles, but this is taught by Michail (fig. 9; trapezoid 523 is represented as triangles 900 and 902; also see sections 0057-0058, 0062, 0065, and 0069). It would have been obvious to one of ordinary skill in the art to modify Fisher in view of Michail to break trapezoids into triangles in order to accommodate situations involving uneven edge slopes (section 0058) and rendering problems (sections 0062, 0065, 0068, 0072) which is an issue not expressly addressed by Fisher in the mapping of the rectangular textures to the image.

Neither Fisher nor Michail explicitly discloses that the trapezoids are completely represented by triangles, since Michail teaches that just a portion of each trapezoid is represented by a triangle. Obata, however, discloses a polygon division method that fully represents each trapezoid as two triangles (fig. 17; col. 2, line 67-col. 3, line 23). The motivation for this is to use polygons of the simplest construction to enable filling of and display of polygons at high speed (col. 1, lines 11-21). It would have been obvious

to one skilled in the art to modify Fisher and Michail to completely divide trapezoids into triangles in order to increase speeds as taught by Obata.

8.   As to claim 14, Michail teaches a Gouraud shading technique for reducing line anti-aliasing (see Abstract and sections 0069-0070). It would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Fisher in view of Michail to include anti-aliasing because such a process improves the visual appearance and resolution of presented graphics.

9.   As to claim 20, Fisher teaches that textures are rectangular and that mapping occurs along a radial bounded by the top and bottom of the assigned range bin (col. 2, line 65-col. 3, line 5; col. 5, lines 45-65; col. 6, lines 36-45; col. 7, lines 15-20; col. 8, lines 40-50).

10.   Claim 15 is rejected under 35 USC 103(a) as unpatentable over Fisher in view of Michail and Obata as applied to claim 13 above, and further in view of Richens (U.S. Patent 6,226,000)

11.   As to claim 15, Michail further discloses different shading and colors applied to the edge line profile of the triangles (sections 0069-0070), but none of Fisher, Michail, and Obata explicitly discloses a texel column that transitions from dark to light to dark. Richens, however, discloses the alpha value, or transparency value, of a texel column varying sinusoidally, from opaque to transparent to opaque (fig. 26; col. 24, lines 18-32). Note that the effect of this is shown in fig. 25, with dark lines between patches of light in a texel column. The motivation for this is to apply hatching of variable density (col. 25, lines 5-17) and offer assistance to a user in CAD programming (col. 1, lines 34-57). It

would have been obvious to one skilled in the art to modify Fisher, Michail, and Obata to

transition a texel column from dark to light to dark in order to allow a user to improve

upon a scene as taught by Richens.

12.   Claim 16 is rejected under 35 USC 103(a) as unpatentable over Fisher in view of

Michail and Obata as applied to claim 13 above, and further in view of Mukoyama (U.S.

Publication 2005/0035979).

13.   As to claim 16, none of Fisher, Michail, and Obata explicitly discloses that the

texture is symmetrical about a midline of a trapezoid, but Mukoyama teaches that it is

well known to insert textures in a symmetric manner (sections 0004 and 0019-0022). It

would have been obvious to one of ordinary skill in the art to modify Fisher, Michail, and

Obata to insert textures in this manner to assure that such objects appear to be the

most realistic and that radial mapping is easier (sections 0004 and 0019-0022).

14.   Claim 17 is rejected under 35 USC 103(a) as unpatentable over Fisher in view of

Michail and Obata as applied to claim 13 above, and further in view of Ikedo (U.S.

Patent 5,900,881).

15.   As to claim 17, none of Fisher, Michail, and Obata explicitly discloses applying a

reverse perspective view transformation to textures. Ikedo, however, discloses, in col.

5, lines 45-51, that a reverse perspective view transformation is desirable when angles

are defined in device coordinates. It would have been obvious to one of ordinary skill in

the art to modify Fisher, Michail, and Obata to utilize reverse-perspective view transform

when the angles involved are defined in device coordinates as taught by Ikedo.

16.   Claims 18-19 are rejected under 35 USC 103(a) as unpatentable over Fisher in view of Michail and Obata as applied to claim 13 above, and further in view of Foley (cited in last OA).

17.   As to claims 18 and 19, none of Fisher, Michail, and Obata explicitly discloses a multiple variation for forming a trapezoid in accordance with the arc(s) and/or the curve(s). Foley, however, teaches such a limitation (Fig. 11.27, pages 500-501). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fisher, Michail, and Obata to utilize such a technique as in Foley to allow for more flexibility in creating trapezoids (pages 500-501), which is in accordance with the various techniques of Michail.

Conclusion

18.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37. CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of
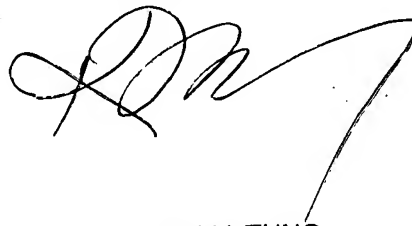
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

\Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron M. Richer whose telephone number is (571) 272-7790. The examiner can normally be reached on weekdays from 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on (571) 272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AMR
2/24/08

KEE M. TUNG
SUPERVISORY PATENT EXAMINER